

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2000-001033
(43)Date of publication of application : 07.01.2000

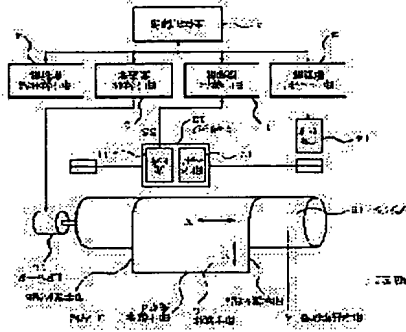
(51)Int.Cl. B41J 29/50
B41J 19/18

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(22)Date of filing : 12.06.1998 (72)Inventor : EGAWA HIROMI

(4) APPARATUS FOR DETECTING END OF PRINTING MEDIUM AND PRINTING APPARATUS
USING THE SAME

(57)Abstract:
PROBLEM TO BE SOLVED: To provide an apparatus for detecting a correct end of a printing medium having a part where the end cannot be detected.

SOLUTION: This printing medium end-detecting apparatus includes a photosensor 11 which can distinguish a platen 16 and a printing medium 6 mounted to the platen 16 by colors, a printing head-driving part 2 for moving a carriage 13 loading the photosensor 11 and a printing medium transfer part 3 for moving the printing medium 6 in a longitudinal direction (Y direction). Moreover, the apparatus has a printing medium-detecting part 1 for detecting a position of the printing medium 6 from an output signal SS of the photosensor 11 and a position of the carriage 13, and a printing medium end-analyzing part 4 for moving the carriage 13 in a lateral direction (X direction) by the printing head-driving part 2 and moving the printing medium 6 in the longitudinal direction by the printing medium transfer part 3 as necessary, thereby detecting ends (a) and (b) of the printing medium.



LEGAL STATUS

[Date of request for examination] 12.06.1998
[Date of sending the examiner's decision of rejection] 01.02.2000

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]
[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]
[Date of extinction of right]

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CLAIMS

[Claim(s)]

[Claim 1] The sensor which can color distinguish the printing medium with which a platen and sensor and print head are equipped, The print head driving means to which the carriage which carried this move said printing medium to a lengthwise direction (the direction of Y), and a printing medium detection means to detect the location of said printing medium with the location of the output signal of said sensor, and said carriage. Printing medium edge detection equipment characterized by having a printing medium edge analysis means to detect a printing medium edge by moving said carriage to a longitudinal direction (the direction of X) by said print head driving means, and moving said printing medium to a lengthwise direction with said printing medium conveyance means if needed.

[Claim 2] The sensor which can color distinguish the printing medium with which a platen and sensor and print head are equipped, The print head driving means to which the carriage which carried this move said printing medium to a lengthwise direction (the direction of Y), and a printing medium detection means to detect the location of said printing medium with the location of the output signal of said sensor, and said carriage. Said carriage is moved to a longitudinal direction (the direction of X) by said print head driving means, and the need is accepted. Said printing medium with said printing medium conveyance means The printer characterized by having printing medium edge detection equipment which consists of a printing medium edge analysis means to detect a printing medium edge by moving to a lengthwise direction.

[Claim 3] The sensor which can color distinguish the printing medium with which a platen and sensor and print head are equipped, The print head driving means to which the carriage which carried this move said printing medium to a lengthwise direction (the direction of Y), and a printing medium detection means to detect the location of said printing medium with the location of the output signal of said sensor, and said carriage. Said printing medium is moved to a lengthwise direction (the direction of Y) with said printing medium conveyance means, and the need is accepted. Said carriage by said print head driving means Printing medium edge detection equipment characterized by having a printing medium edge analysis means to detect a printing medium head by moving to a longitudinal direction (the direction of X).

[Claim 4] The sensor which can color distinguish the printing medium with which a platen and sensor and print head are equipped, The print head driving means to which the carriage which carried this move said printing medium to a lengthwise direction (the direction of Y), and a printing medium detection means to detect the location of said printing medium with the location of the output signal of said sensor, and said carriage. Said printing medium is moved to a lengthwise direction (the direction of Y) with said printing medium conveyance means, and the need is accepted. Said carriage by said print head driving means The printer characterized by having printing medium edge detection equipment which consists of a printing medium edge analysis means to detect a printing medium head by moving to a longitudinal direction (the direction of X).

[Claim 5] Printing medium edge detection equipment according to claim 1 or 3 characterized by having said sensor which consists of the light emitting device which is a source of luminescence, a component actuation circuit which drives this light emitting device, and a light-receiving circuit which receives the reflected light of said light emitting device.

[Claim 6] The printer according to claim 2 or 4 characterized by having said sensor which consists of the light emitting device which is a source of luminescence, a component actuation circuit which drives this light emitting device, and a light-receiving circuit which receives the reflected light of said light emitting device.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001] [Field of the Invention] This invention relates to the printer which uses the printing medium edge detection equipment and it which can print the print column position and the printed line location from a printing medium edge and a printing medium head in a right location by all printed lines also to a printing medium with a part [that a printing medium edge and a printing medium head cannot detect especially] about the printer which uses printing medium edge detection equipment and it.

[0002]

[Description of the Prior Art] Conventionally, the equipment which calculates printing medium width of face by detecting the left right end location of a printing medium certainly is proposed, without incorrect-detecting "black" part of a printed printing medium with a printing medium edge, as this kind of printer is shown in JP 6-32032A.

[0003] When drawing 4 which shows the configuration of this conventional printer with a block is referred to, this conventional printer Detection by the photosensor 11 is performed carrying out step migration of the carriage 13 toward a right end B from the criteria location A. The location of the carriage 13 when a detecting signal SS is set to H to the beginning is memorized to the left end register PL. Then, when the location of the carriage 13 at that time is memorized to the right end register PR whenever the detecting signal SS changed from H to L, and carriage 13 arrives at a right end B, the difference of PR and PL is calculated and the width of face of a form is determined.

[0004]

[Problem(s) to be Solved by the Invention] The trouble in this conventional printer is undetectable [an exact form edge], when the form edge 61 of the printing medium 6 as shown in drawing 2 is black. The reason is that a photosensor cannot detect a form edge to accuracy. The form edge 61 of the printing medium 6 is black when a platen 16 is black (the platen is generally black).

[0005] The object of this invention is performing control which detects a printing medium edge in an automatically different part also to a printing medium with a part [that a printing medium edge cannot detect], and is to offer the printer which can print the print column position from a printing medium edge in a right location by all printed lines also to a printing medium with a part [that a printing medium edge cannot detect].

[0006]

[Means for Solving the Problem] The sensor [the printing medium edge detection equipment of this invention] which can color distinguish the printing medium with which a platen and this platen were equipped, The print head driving means to which the carriage which carried this sensor and print head is moved along with said platen, A printing medium conveyance means to move said printing medium to a lengthwise direction (the direction of Y), and a printing medium detection means to detect the location of said printing medium with the location of the output signal of said sensor, and said carriage, It has a printing medium edge analysis means to detect a printing medium edge, by moving said carriage to a longitudinal direction (the direction of X) by

said print head driving means, and moving said printing medium to a lengthwise direction with said printing medium conveyance means if needed.

[0007] Moreover, the sensor [the printer of this invention] which can color distinguish the printing medium with which a platen and this platen were equipped, The print head driving means to which the carriage which carried this sensor and print head is moved along with said platen, A printing medium conveyance means to move said printing medium to a lengthwise direction (the direction of Y), and a printing medium detection means to detect the location of said printing medium with the location of the output signal of said sensor, and said carriage, It has printing medium edge detection equipment which consists of a printing medium edge analysis means to detect a printing medium edge by moving said carriage to a longitudinal direction (the direction of X) by said print head driving means, and moving said printing medium to a lengthwise direction with said printing medium conveyance means if needed.

[0008] Furthermore, the sensor [the printing medium edge detection equipment of this invention] which can color distinguish the printing medium with which a platen and this platen were equipped, The print head driving means to which the carriage which carried this sensor and print head is moved along with said platen, A printing medium conveyance means to move said printing medium to a lengthwise direction (the direction of Y), and a printing medium detection means to detect the location of said printing medium with the location of the output signal of said sensor, and said carriage, It has a printing medium edge analysis means to detect a printing medium head, by moving said printing medium to a lengthwise direction (the direction of Y) with said printing medium conveyance means, and moving said carriage to a longitudinal direction (the direction of X) by said print head driving means if needed.

[0009] Furthermore, the sensor [the printer of this invention] which can color distinguish the printing medium with which a platen and this platen were equipped, The print head driving means to which the carriage which carried this sensor and print head is moved along with said platen, A printing medium conveyance means to move said printing medium to a lengthwise direction (the direction of Y), and a printing medium detection means to detect the location of said printing medium with the location of the output signal of said sensor, and said carriage, It has printing medium edge detection equipment which consists of a printing medium edge analysis means to detect a printing medium head by moving said printing medium to a lengthwise direction (the direction of Y) with said printing medium conveyance means, and moving said carriage to a longitudinal direction (the direction of X) by said print head driving means if needed.

[Embodiment of the Invention] Next, the gestalt of operation of this invention is explained to a detail with reference to a drawing.

[0011] When drawing 1 which shows the gestalt of 1 operation of this invention with a block is referred to, the printing medium edge detection equipment of the gestalt of this operation The photosensor 11 which can distinguish the black of the platen 16 to which the front face carried out the color of a black system by the product made of rubber, and the white of the printing medium 6 with which this platen 16 was equipped, With the print head actuator 2 which drives the CR motor 14 to which the carriage 13 which carried the photosensor 11 and the print head 12 is moved along with a platen 16 The printing medium conveyance section 3 which is made to rotate a platen 16 by the LF motor 15, and moves the printing medium 6 to a lengthwise direction (the direction of Y). The printing medium detection section 1 which detects the location of the printing medium 6 with the location of the output signal SS of a photosensor 11, and carriage 13, It consists of the printing medium edge analysis section 4 which detects a printing medium edge, and a whole control section 5 which controls each configuration section by moving carriage 13 to a longitudinal direction (the direction of X) by the print head actuator 2, and moving the printing medium 6 to a lengthwise direction by the printing medium conveyance section 3 if needed.

[0012] If drawing 3 which explains the configuration of a photosensor 11 to a detail further is referred to, this photosensor 11 consists of the light emitting device 110 which is a source of luminescence, a component actuation circuit 111 which drives a light emitting device 110, and a light-receiving circuit 112, it will reflect in a platen 16 or the printing medium 6 spontaneously,

and that reflected light will carry out incidence of the optical path R which shows the light emitted from the light emitting device 110 by the dotted line to the light-receiving circuit 112. This reflected light is weak from the platen 16 of the color of a black system, and since it returns strongly enough from the printing medium 6 of the color of a white system, the light-receiving circuit 112 is a configuration which distinguishes both and outputs the detecting signal SS of L and H corresponding to each.

[0013] In addition, what suited the construction material of the printing medium 6 detected in addition to the sensor using the light by the combination of an above-mentioned light emitting device and a light-receiving circuit can be used for this photosensor 11.

[0014] Next, actuation of the gestalt of this operation is explained with reference to drawing 1 and drawing 2.

[0015] First, the carriage 13 which carried the photosensor 11 and the print head 12 is moved to the printing criteria location A by the print head actuator 2. Next, this carriage 13 is driven by the print head actuator 2 in a longitudinal direction. While the print head actuator 2 operates, the carriage 13 carries the output SS of a photosensor 11 changes is memorized in the printing medium detection section 1. When carriage 13 arrives at a right end B, a longitudinal direction is made to carry out specified quantity migration of the printing medium 6 by the printing medium conveyance section 3. Next, carriage 13 is moved to a longitudinal direction by the print head actuator 2, and the location where the output SS of a photosensor 11 changes is memorized in the printing medium detection section 1. By repeating such actuation, the printing medium detection section 1 memorizes the vertical printing medium edges a and b to the longitudinal direction of the printing medium 6 under a photosensor 11 as a coordinate group which constitutes one line respectively. Based on these coordinate groups, it analyzes by the printing medium edge analysis section 4, the distance from the printing criteria location A to the printing medium edges a and b is measured, and the print column position from the printing medium edge which should print the target printing data is decided.

[0016] As having explained above, according to this invention, it makes it possible to print in a longitudinal direction in a right location also to the printed line from which it becomes impossible to detect a printing medium edge by performing two or more printing medium edge detection about a printing medium [that a part of printing medium edge 61 cannot detect], as shown in drawing 2 in the printer which detects the printing medium edges a and b of the printing medium 6, and determines a lateral printing starting position.

[0017] Next, the gestalt of other operations of this invention is explained with reference to drawing 1.

[0018] Although it was adapted for the method which decides the print column position from the printing medium edges a and b of a longitudinal direction with the gestalt of the above-mentioned operation, this invention can be adapted for the method which decides the printed line location from the lateral printing medium head d.

[0019] If drawing 1 is referred to, in order to detect the printed line location from the printing medium head d to the printing medium 6 set to the criteria location C by the printing medium conveyance section 3, the carriage 13 which carried the photosensor 11 and the print head 12 is moved to the printing criteria location A, and a longitudinal direction (the direction of Y) is made to carry out specified quantity conveyance of the printing medium 6 by the printing medium conveyance section 3. Next, carriage 13 is driven by the print head actuator 2 in a longitudinal direction (the direction of X). If a photosensor 11 arrives at the location a, i.e., the printing medium edge, at which the output SS of the photosensor 11 carried in carriage 13 changes, next, the printing medium conveyance section 3 will carry out specified quantity conveyance of the printing medium 6 in a longitudinal direction until the output SS of a photosensor 11 changes, and will memorize the location in the printing medium detection section 1. Next, carriage 13 is driven by the print head actuator 2 in a longitudinal direction (the direction of X), specified quantity conveyance is carried out in a longitudinal direction until the output SS of a photosensor 11 changes the printing medium 6 with the printing medium conveyance sections 3, and the location is memorized in the printing medium detection section 1. By repeating such actuation, the printing medium detection section 1 memorizes the printing medium head d of the printing

medium 6 as a coordinate group which constitutes one line. Based on these coordinate groups, it analyzes by the printing medium edge analysis section 4, the distance from the criteria location C to the printing medium head d is measured, and the printed line location from the printing medium head d which should print the target printing data is decided.

[0020] As having explained above, according to this invention, it makes it possible to print to a longitudinal direction in a right location also to the printed line from which it becomes impossible to detect a printing medium head by performing two or more printing medium head detection about a printing medium [that a part of printing medium head 61 cannot detect], as shown in drawing 2 in the printer which detects the printing medium head d of the printing medium 6, and determines the printing starting position of a longitudinal direction.

[0021]

[Effect of the Invention] By according to this invention, conveying a sensor in a longitudinal direction, making a longitudinal direction convey a printing medium, and repeating detection actuation at a printing medium edge and the head of a printing medium, when a printing medium edge and a printing medium head cannot detect as explained above. Also as opposed to a printing medium with a part [that a printing medium edge and a printing medium head cannot detect] The print column position from a printing medium edge and a printing medium head can be correctly decided about all printed lines, and the effectiveness that it is always printable in a right print column position and a printed line location is acquired.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the configuration of the gestalt of 1 operation of this operation.

[Drawing 2] the gestalt of this operation --- it is drawing showing an example [that a part of printing medium edge to kick and printing medium head cannot detect].

[Drawing 3] It is the block diagram of the photosensor in the gestalt of this operation.

[Drawing 4] It is the block diagram showing the configuration of the conventional example.

[Description of Notations]

- 1 Printing Medium Detection Section
- 2 Print Head Actuator
- 3 Printing Medium Conveyance Section
- 4 Printing Medium Edge Analysis Section
- 5 Whole Control Section
- 6 Printing Medium
- 11 Photosensor
- 12 Print Head
- 13 Carriage
- 14 CR Motor
- 15 LF Motor
- 16 Platen
- 110 Light Emitting Device
- 111 Component Actuation Circuit
- 112 Light-receiving Circuit

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(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開2000-1033

(P2000-1033A)

(43) 公開日 平成12年1月7日 (2000. 1. 7)

(51) Int.Cl.

識別記号

F I

ターム (参考)

B 4 1 J 29/50
19/18

B 4 1 J 29/50
19/18

B 2 C 0 6 1
E 2 C 4 8 0

審査請求 有 請求項の数 6 O L (全 5 頁)

(21) 出願番号 特願平10-165299

(22) 出願日 平成10年6月12日 (1998. 6. 12)

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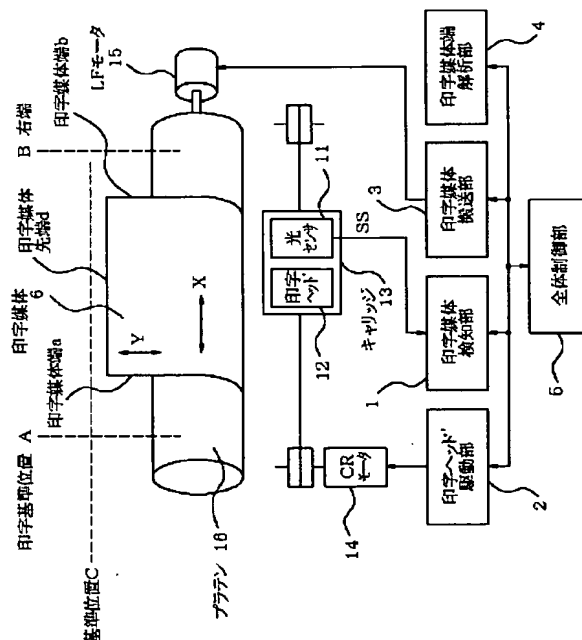
Fターム (参考) 2C061 BB08 MM07 MM12
2C480 CA40 CB31

(54) 【発明の名称】 印字媒体端検知装置およびそれを使用する印字装置

(57) 【要約】

【課題】 印字媒体端が検知不可である箇所を持つ印字媒体に対して、正しい印字媒体端を検知する印字媒体端検知装置を提供する。

【解決手段】 この印字媒体端検知装置は、プラテン16とこのプラテン16に装着された印字媒体6とを色判別可能な光センサ11と、この光センサ11と印字ヘッド12とを搭載したキャリッジ13をプラテン16に沿って移動させる印字ヘッド駆動部2と、印字媒体6を縦方向 (Y方向) に移動する印字媒体搬送部3とを備える。また、光センサ11の出力信号SSおよびキャリッジ13の位置により印字媒体6の位置を検知する印字媒体検知部1と、キャリッジ13を印字ヘッド駆動部2により横方向 (X方向) に移動し、必要に応じて印字媒体6を印字媒体搬送部3により縦方向に移動することにより、印字媒体端aおよびbを検出する印字媒体端解析部4とを備える。



【特許請求の範囲】

【請求項 1】 プラテンとこのプラテンに装着された印字媒体とを色判別可能なセンサと、このセンサと印字ヘッドとを搭載したキャリッジを前記プラテンに沿って移動させる印字ヘッド駆動手段と、前記印字媒体を縦方向（Y 方向）に移動する印字媒体搬送手段と、前記センサの出力信号および前記キャリッジの位置により前記印字媒体の位置を検知する印字媒体検知手段と、前記キャリッジを前記印字ヘッド駆動手段により横方向（X 方向）に移動し必要に応じて前記印字媒体を前記印字媒体搬送手段により縦方向に移動することにより印字媒体端を検出する印字媒体端解析手段とを備えることを特徴とする印字媒体端検知装置。

【請求項 2】 プラテンとこのプラテンに装着された印字媒体とを色判別可能なセンサと、このセンサと印字ヘッドとを搭載したキャリッジを前記プラテンに沿って移動させる印字ヘッド駆動手段と、前記印字媒体を縦方向（Y 方向）に移動する印字媒体搬送手段と、前記センサの出力信号および前記キャリッジの位置により前記印字媒体の位置を検知する印字媒体検知手段と、前記キャリッジを前記印字ヘッド駆動手段により横方向（X 方向）に移動し必要に応じて前記印字媒体を前記印字媒体搬送手段により縦方向に移動することにより印字媒体端を検出する印字媒体端解析手段とから成る印字媒体端検知装置を備えることを特徴とする印字装置。

【請求項 3】 プラテンとこのプラテンに装着された印字媒体とを色判別可能なセンサと、このセンサと印字ヘッドとを搭載したキャリッジを前記プラテンに沿って移動させる印字ヘッド駆動手段と、前記印字媒体を縦方向（Y 方向）に移動する印字媒体搬送手段と、前記センサの出力信号および前記キャリッジの位置により前記印字媒体の位置を検知する印字媒体検知手段と、前記印字媒体を前記印字媒体搬送手段により縦方向（Y 方向）に移動し必要に応じて前記キャリッジを前記印字ヘッド駆動手段により横方向（X 方向）に移動することにより印字媒体先端を検出する印字媒体端解析手段とを備えることを特徴とする印字媒体端検知装置。

【請求項 4】 プラテンとこのプラテンに装着された印字媒体とを色判別可能なセンサと、このセンサと印字ヘッドとを搭載したキャリッジを前記プラテンに沿って移動させる印字ヘッド駆動手段と、前記印字媒体を縦方向（Y 方向）に移動する印字媒体搬送手段と、前記センサの出力信号および前記キャリッジの位置により前記印字媒体の位置を検知する印字媒体検知手段と、前記印字媒体を前記印字媒体搬送手段により縦方向（Y 方向）に移動し必要に応じて前記キャリッジを前記印字ヘッド駆動手段により横方向（X 方向）に移動することにより印字媒体先端を検出する印字媒体端解析手段とから成る印字媒体端検知装置を備えることを特徴とする印字装置。

【請求項 5】 発光源である発光素子と、この発光素子

を駆動する素子駆動回路と、前記発光素子の反射光を受光する受光回路とからなる前記センサを備えることを特徴とする請求項 1 または 3 記載の印字媒体端検知装置。

【請求項 6】 発光源である発光素子と、この発光素子を駆動する素子駆動回路と、前記発光素子の反射光を受光する受光回路とからなる前記センサを備えることを特徴とする請求項 2 または 4 記載の印字装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は印字媒体端検知装置およびそれを使用する印字装置に関し、特に印字媒体端および印字媒体先端が検知不可である箇所を持つ印字媒体に対しても全ての印字行で印字媒体端および印字媒体先端からの印字桁位置および印字行位置を正しい位置に印字することのできる印字媒体端検知装置およびそれを使用する印字装置に関する。

【0002】

【従来の技術】従来、この種の印字装置は、たとえば特開平 6-32032 号公報に示されるように、印字済み印字媒体の「黒」部分を印字媒体端と誤検出することなく、確実に印字媒体の左右端位置を検出して印字媒体幅を計算する装置が提案されている。

【0003】この従来の印字装置の構成をブロックで示す図 4 を参照すると、この従来の印字装置は、キャリッジ 13 を基準位置 A から右端 B に向かってステップ移動しながら光センサ 11 による検出を行い、検出信号 SS が最初に H になった時のキャリッジ 13 の位置を左端レジスタ PL に記憶し、その後、検出信号 SS が H から L に変化する度にその時のキャリッジ 13 の位置を右端レジスタ PR に記憶し、キャリッジ 13 が右端 B に達したときに PR と PL の差を計算して用紙の幅を決定する。

【0004】

【発明が解決しようとする課題】この従来の印字装置における問題点は、図 2 に示すような印字媒体 6 の用紙端部 61 が黒色である場合、正確な用紙端を検出できない、ということである。その理由は、プラテン 16 が黒色の場合（一般には、プラテンは黒色である）印字媒体 6 の用紙端部 61 が黒色であると、光センサが用紙端を正確には検出できないからである。

【0005】本発明の目的は、印字媒体端が検知不可である箇所を持つ印字媒体に対しても、自動的に異なる箇所で印字媒体端を検知する制御を行うことで、印字媒体端が検知不可である箇所を持つ印字媒体に対しても、全ての印字行で印字媒体端からの印字桁位置を正しい位置に印字することのできる印字装置を提供することにある。

【0006】

【課題を解決するための手段】本発明の印字媒体端検知装置は、プラテンとこのプラテンに装着された印字媒体とを色判別可能なセンサと、このセンサと印字ヘッドと

を搭載したキャリッジを前記プラテンに沿って移動させる印字ヘッド駆動手段と、前記印字媒体を縦方向（Y方向）に移動する印字媒体搬送手段と、前記センサの出力信号および前記キャリッジの位置により前記印字媒体の位置を検知する印字媒体検知手段と、前記キャリッジを前記印字ヘッド駆動手段により横方向（X方向）に移動し必要に応じて前記印字媒体を前記印字媒体搬送手段により縦方向に移動することにより印字媒体端を検出する印字媒体端解析手段とを備える。

【0007】また、本発明の印字装置は、プラテンとこのプラテンに装着された印字媒体とを色判別可能なセンサと、このセンサと印字ヘッドとを搭載したキャリッジを前記プラテンに沿って移動させる印字ヘッド駆動手段と、前記印字媒体を縦方向（Y方向）に移動する印字媒体搬送手段と、前記センサの出力信号および前記キャリッジの位置により前記印字媒体の位置を検知する印字媒体検知手段と、前記キャリッジを前記印字ヘッド駆動手段により横方向（X方向）に移動し必要に応じて前記印字媒体を前記印字媒体搬送手段により縦方向に移動することにより印字媒体端を検出する印字媒体端解析手段とから成る印字媒体端検知装置を備える。

【0008】さらに、本発明の印字媒体端検知装置は、プラテンとこのプラテンに装着された印字媒体とを色判別可能なセンサと、このセンサと印字ヘッドとを搭載したキャリッジを前記プラテンに沿って移動させる印字ヘッド駆動手段と、前記印字媒体を縦方向（Y方向）に移動する印字媒体搬送手段と、前記センサの出力信号および前記キャリッジの位置により前記印字媒体の位置を検知する印字媒体検知手段と、前記印字媒体を前記印字媒体搬送手段により縦方向（Y方向）に移動し必要に応じて前記キャリッジを前記印字ヘッド駆動手段により横方向（X方向）に移動することにより印字媒体先端を検出する印字媒体端解析手段とを備える。

【0009】さらに、本発明の印字装置は、プラテンとこのプラテンに装着された印字媒体とを色判別可能なセンサと、このセンサと印字ヘッドとを搭載したキャリッジを前記プラテンに沿って移動させる印字ヘッド駆動手段と、前記印字媒体を縦方向（Y方向）に移動する印字媒体搬送手段と、前記センサの出力信号および前記キャリッジの位置により前記印字媒体の位置を検知する印字媒体検知手段と、前記印字媒体を前記印字媒体搬送手段により縦方向（Y方向）に移動し必要に応じて前記キャリッジを前記印字ヘッド駆動手段により横方向（X方向）に移動することにより印字媒体先端を検出する印字媒体端解析手段とから成る印字媒体端検知装置を備える。

【0010】

【発明の実施の形態】次に、本発明の実施の形態について図面を参照して詳細に説明する。

【0011】本発明の一実施の形態をブロックで示す図

1を参照すると、この実施の形態の印字媒体端検知装置は、表面がゴム製で黒系統の色をしたプラテン16の黒とこのプラテン16に装着された印字媒体6の白とを判別可能な光センサ11と、光センサ11と印字ヘッド12とを搭載したキャリッジ13をプラテン16に沿って移動させるCRモータ14を駆動する印字ヘッド駆動部2と、プラテン16をLFモータ15により回転させて印字媒体6を縦方向（Y方向）に移動する印字媒体搬送部3と、光センサ11の出力信号SSおよびキャリッジ13の位置により印字媒体6の位置を検知する印字媒体検知部1と、キャリッジ13を印字ヘッド駆動部2により横方向（X方向）に移動し必要に応じて印字媒体6を印字媒体搬送部3により縦方向に移動することにより印字媒体端を検出する印字媒体端解析部4と、各構成部を制御する全体制御部5とから構成される。

【0012】光センサ11の構成をさらに詳細に説明する図3を参照すると、この光センサ11は、発光源である発光素子110と、発光素子110を駆動する素子駆動回路111と、受光回路112とからなり、発光素子110から発した光は点線で示す光路Rを進んでプラテン16または印字媒体6に当たって反射し、その反射光が受光回路112に入射する。この反射光は、黒系統の色のプラテン16からは弱く、白系統の色の印字媒体6からは十分に強く返るから、受光回路112は両者を判別してそれぞれに対応したLとHの検出信号SSを出力する構成である。

【0013】なお、この光センサ11は、上述の発光素子と受光回路との組み合わせによる光を利用したセンサ以外に、検出する印字媒体6の材質に適したものを使用することができる。

【0014】次に、図1および図2を参照して、この実施の形態の動作を説明する。

【0015】まず、印字ヘッド駆動部2によって、光センサ11および印字ヘッド12を搭載したキャリッジ13を印字基準位置Aまで移動する。次に、このキャリッジ13を横方向に印字ヘッド駆動部2により駆動する。印字ヘッド駆動部2が動作するとともに、光センサ11の出力SSが変化する位置を印字媒体検知部1に記憶する。キャリッジ13が右端Bに達すると、印字媒体搬送部3により、印字媒体6を縦方向に所定量移動させる。次に、印字ヘッド駆動部2によりキャリッジ13を横方向に移動させて、光センサ11の出力SSが変化する位置を印字媒体検知部1に記憶する。このような動作を繰り返すことにより、光センサ11下の印字媒体6の横方向に対して垂直方向の印字媒体端aおよびbをおおの一本の線を構成する座標群として印字媒体検知部1に記憶される。これらの座標群に基づいて、印字媒体端解析部4によって解析を行い、印字基準位置Aから印字媒体端aおよびbまでの距離を計測し、目的の印字データを印字するべき印字媒体端からの印字桁位置を確定する。

【0016】以上説明したように、本発明によれば、印字媒体6の印字媒体端aおよびbを検知して横方向の印字開始位置を決定する印字装置において、図2に示すように印字媒体端の一部61が検知不可である印字媒体について複数箇所の印字媒体端検知をおこなうことで、印字媒体端が検知不可となるような印字行に対しても横方向に正しい位置に印字することを可能にできる。

【0017】次に、本発明の他の実施の形態について、図1を参照して説明する。

【0018】前述の実施の形態では、縦方向の印字媒体端aおよびbからの印字桁位置を確定する方式に適応したが、本発明は横方向の印字媒体先端dからの印字行位置を確定する方式に適応することができる。

【0019】図1を参照すると、印字媒体搬送部3によって基準位置Cにセットされた印字媒体6に対して、印字媒体先端dからの印字行位置を検知するために、光センサ11および印字ヘッド12を搭載したキャリッジ13を印字基準位置Aに移動し、印字媒体搬送部3によって印字媒体6を縦方向（Y方向）に所定量搬送させる。次に、キャリッジ13を横方向（X方向）に印字ヘッド駆動部2により駆動する。キャリッジ13に搭載してある光センサ11の出力SSが変化する位置すなわち印字媒体端aに光センサ11が達すると、次に、印字媒体搬送部3は印字媒体6を光センサ11の出力SSが変化するまで縦方向に所定量搬送し、その位置を印字媒体検知部1に記憶する。次に、キャリッジ13を横方向（X方向）に印字ヘッド駆動部2により駆動し、印字媒体搬送部3により印字媒体6を光センサ11の出力SSが変化するまで縦方向に所定量搬送し、その位置を印字媒体検知部1に記憶する。このような動作を繰り返すことにより、印字媒体6の印字媒体先端dを一本の線を構成する座標群として印字媒体検知部1に記憶される。これらの座標群に基づいて、印字媒体端解析部4によって解析を行い、基準位置Cから印字媒体先端dまでの距離を計測し、目的の印字データを印字するべき印字媒体先端dからの印字行位置を確定する。

【0020】以上説明したように、本発明によれば、印字媒体6の印字媒体先端dを検知して縦方向の印字開始位置を決定する印字装置において、図2に示すように印

字媒体先端の一部61が検知不可である印字媒体6について複数箇所の印字媒体先端検知をおこなうことで、印字媒体先端が検知不可となるような印字行に対しても縦方向に正しい位置に印字することを可能にできる。

【0021】

【発明の効果】以上説明したように、本発明によれば、印字媒体端および印字媒体先端が検知不可である場合に、センサを横方向に印字媒体を縦方向に搬送させ、印字媒体端および印字媒体先端の検知動作を繰り返すことで、印字媒体端および印字媒体先端が検知不可である部分を持つ印字媒体に対しても、全ての印字行について印字媒体端および印字媒体先端からの印字桁位置を正しく確定することができ、常に正しい印字桁位置および印字行位置に印字することができるという効果が得られる。

【図面の簡単な説明】

【図1】本発明の一実施の形態の構成を示すブロック図である。

【図2】この実施の形態における印字媒体端および印字媒体先端の一部が検知不可である一例を示す図である。

【図3】この実施の形態における光センサの構成図である。

【図4】従来例の構成を示すブロック図である。

【符号の説明】

- | | |
|-----|----------|
| 1 | 印字媒体検知部 |
| 2 | 印字ヘッド駆動部 |
| 3 | 印字媒体搬送部 |
| 4 | 印字媒体端解析部 |
| 5 | 全体制御部 |
| 6 | 印字媒体 |
| 11 | 光センサ |
| 12 | 印字ヘッド |
| 13 | キャリッジ |
| 14 | CRモータ |
| 15 | LFモータ |
| 16 | プラテン |
| 110 | 発光素子 |
| 111 | 素子駆動回路 |
| 112 | 受光回路 |

【図2】

